

Examiner mailed a first Office action in the RCE on 6/8/04 in which he rejected claims 2, 4-6, 8, 10-23, 25-27, and 29 under 35 U.S.C. 102(e) as anticipated by a new reference, U.S. Patent 6,088,694, Burns, et al., *Continuous availability and efficient backup for externally referenced*
5 *objects*, issued 7/11/02, hereinafter "Burns", and rejected claims 3, 7, 9, 24, 28, 30, and 31 under 35 U.S.C. 103(a) as being unpatentable over Burns in view of Lampson. Applicants are amending claim 11 to correct a typographical error noted by Applicants and are otherwise traversing the rejection.

10 **Please amend the claims as follows:**

Claim 1: Canceled

1 **2. (previously presented)** The method set forth in claim 11 wherein:
2 the protocol ensures that the results of the transaction are consistent in
3 the components; and
4 in the step of receiving an augmented one of the messages, the information
5 indicating the relevant state indicates whether the transaction will modify data in the
6 other component.

1 **3. (previously presented)** The method set forth in claim 2 wherein:
2 the protocol is a two-phase commit protocol;
3 the first component is the coordinator for the protocol; and
4 in the step of using the retained relevant state to optimize the protocol the first
5 component sends a message that aborts the transaction to an other component when
6 the other component's retained relevant state indicates that the transaction does not
7 modify the data in the other component.

1 **4. (original)** The method set forth in claim 3 wherein:

2 the distributed system is a distributed database system and the components are
3 database systems therein.

1 **5. (previously presented)** A method of ensuring that a first component of a
2 distributed system that exchanges messages that belong to a transaction with one or
3 more other components of the distributed system is additionally aware of a state of an
4 other component, the state being relevant to a protocol that is employed with the
5 transaction and

6 the method comprising the steps practiced in the other component of:

7 determining the relevant state; and

8 augmenting a message of the transaction with state information indicating the
9 relevant state of the other component,

10 the first component using the state information to optimize the protocol.

1 **6. (original)** The method set forth in claim 5 wherein:

2 the relevant state indicates whether the transaction will modify data in the
3 other component.

1 **7. (original)** The method set forth in claim 6 wherein:

2 the protocol is a two-phase commit protocol; and

3 the other component receives an abort message of the protocol when the
4 relevant state indicates that the transaction will not modify the data in the other
5 component.

1 **8. (original)** The method set forth in claim 7 wherein:

2 the distributed system is a distributed database system and the components are
3 database systems therein.

1 **9. (previously presented)** A method of executing a two-phase commit protocol for a
2 transaction, the transaction involving a coordinator and a cohort and
3 the method comprising the steps performed in the coordinator of:

4 receiving a message of the transaction from the cohort, the message being
5 augmented with state information indicating whether the transaction modifies the
6 cohort's data;

7 retaining the state information for the cohort; and

8 if the state information for the cohort indicates that the transaction does not
9 modify the cohort's data, sending an abort message of the two-phase commit protocol
10 to the cohort.

1 **10. (previously presented)** A method of executing a two-phase commit protocol for a
2 transaction, the transaction involving a coordinator and a cohort and
3 the method comprising the steps performed in the cohort of:

4 augmenting a message that the cohort sends to the coordinator as part of the
5 transaction with state information indicating whether the transaction will modify the
6 cohort; and

7 responding to messages received from the coordinator as required by the
8 commit protocol,

9 the coordinator sending a message of the commit protocol to the cohort as determined
10 by the state information.

1 **11. (currently amended)** A method of ensuring that a first component of a
2 distributed system that exchanges messages belonging to a transaction with one or
3 more other components of the distributed system is additionally aware of a state of an
4 other component, the state being ~~is~~ relevant to a protocol employed with the
5 transaction and
6 the method comprising the steps practiced in the first component of:
7 receiving an augmented one of the messages, the augmented message having
8 been augmented by the other component to additionally contain information
9 indicating the relevant state of the other component;
10 retaining the relevant state from the augmented message; and
11 using the retained relevant state to optimize the protocol.

1 **12. (previously presented)** A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 11.

1 **13. (previously presented)** A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 2.

1 **14. (previously presented)** A data storage device, characterized in that:
2 the data storage device contains code which, when executed by a processor, performs
3 the method of claim 3.

1 **15. (previously presented)** A data storage device, characterized in that:

- 2 the data storage device contains code which, when executed by a processor, performs
- 3 the method of claim 4.

- 1 **16. (previously presented)** A data storage device, characterized in that:
- 2 the data storage device contains code which, when executed by a processor, performs
- 3 the method of claim 5.

- 1 **17. (previously presented)** A data storage device, characterized in that:
- 2 the data storage device contains code which, when executed by a processor, performs
- 3 the method of claim 6.

- 1 **18. (previously presented)** A data storage device, characterized in that:
- 2 the data storage device contains code which, when executed by a processor, performs
- 3 the method of claim 7.

- 1 **19. (previously presented)** A data storage device, characterized in that:
- 2 the data storage device contains code which, when executed by a processor, performs
- 3 the method of claim 8.

- 1 **20. (previously presented)** A data storage device, characterized in that:
- 2 the data storage device contains code which, when executed by a processor, performs
- 3 the method of claim 9.

- 1 **21. (previously presented)** A data storage device, characterized in that:

- 2 the data storage device contains code which, when executed by a processor, performs the
3 method of claim 10.

1 **22. (previously presented)** A coordinator in a distributed system that coordinates a
2 protocol employed with a transaction that exchanges messages with one or more other
3 components of the distributed system,
4 the coordinator having the improvement comprising:
5 retained state information that retains state of an other component that is
6 relevant to the protocol,
7 the coordinator receiving a message of the transaction from the other component
8 which has been augmented with the state information, retaining the state information
9 from the augmented message in the retained state information, and using the retained
10 state information to optimize the protocol.

1 **23. (previously presented)** The coordinator set forth in claim 22 wherein:
2 the protocol ensures that the results of the transaction are consistent in the
3 components; and
4 the retained state information for the other component indicates whether the
5 transaction will modify data in the other component.

1 **24. (previously presented)** The coordinator set forth in claim 23 wherein:
2 the protocol is a two-phase commit protocol; and
3 the coordinator sends a message of the protocol that aborts the transaction to
4 an other component when the other component's retained state indicates that the
5 transaction does not modify the data in the other component.

1 **25. (previously presented)** The coordinator set forth in claim 24 wherein:
2 the distributed system is a distributed database system and the coordinator and
3 the other component are database systems therein.

1 **26. (previously presented)** A cohort in a distributed system, the cohort being
2 involved in a transaction which employs a protocol that is coordinated by a
3 coordinator and exchanging messages of the transaction with the coordinator,
4 the cohort having the improvement comprising:

5 a message of the protocol that is augmented with state information indicating a
6 state of the cohort which is relevant to the protocol,
7 the cohort sending the message to the coordinator and the coordinator retaining the
8 state information and using the retained state information to optimize the protocol.

1 **27. (previously presented)** The cohort set forth in claim 26 wherein:

2 the protocol ensures that the results of the transaction are consistent in the
3 components; and

4 the state information in the augmented message indicates whether the
5 transaction will modify data in the cohort.

1 **28. (previously presented)** The cohort set forth in claim 27 wherein:

2 the protocol is a two-phase commit protocol; and

3 the coordinator sends a message of the protocol that aborts the transaction to
4 the cohort when the retained state information for the cohort indicates that the
5 transaction does not modify the data in the cohort.

1 **29. (previously presented)** The cohort set forth in claim 28 wherein:

2 the distributed system is a distributed database system and the cohort and
3 coordinator are database systems therein.

1 **30. (previously presented)** A coordinator in a distributed system that coordinates a
2 two-phase commit protocol employed with a transaction that involves one or more
3 cohorts in the distributed system,

4 the coordinator having the improvement comprising:

5 retained state information that retains state of a cohort, the state indicating
6 whether the transaction will modify the cohort's data,
7 the coordinator receiving a message of the transaction from the cohort which has been
8 augmented with the state information, retaining the state information from the

9 augmented message in the retained state information, and if the retained state
10 information for the cohort indicates that the transaction does not modify the cohort's
11 data, sending an abort message of the two-phase commit protocol to the cohort.

1 **31. (previously presented)** A cohort in a distributed system in which a coordinator in the
2 distributed system coordinates a two-phase commit protocol employed with a transaction
3 that involves the cohort,
4 the cohort having the improvement comprising:
5 a message of the transaction that is augmented with state information indicating
6 whether the transaction will modify the cohort's data,
7 the cohort sending the message to the coordinator and the coordinator retaining the state
8 information and if the retained state information for the cohort indicates that the
9 transaction does not modify the cohort's data, sending an abort message of the two-phase
10 commit protocol to the cohort.